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Micsig TO1104NAOP2

Micsig TO1104NAOP2 Digital Tablet Oscilloscope User Manual

Model: TO1104NAOP2

1. Introduction

Thank you for choosing the Micsig TO1104NAOP2 Digital Tablet Oscilloscope. This manual provides essential information for the safe and efficient operation of your device. Please read this manual thoroughly before using the oscilloscope and keep it for future reference.

1.1 Safety Information

To prevent personal injury and avoid damage to this product or any products connected to it, review the following safety precautions. Observe all warnings and instructions marked on the product.

- **Use Proper Power Cord:** Use only the power cord specified for this product and certified for the country of use.
- **Ground the Product:** This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground.
- **Connect and Disconnect Properly:** Connect the probe output to the measurement circuit before connecting the probe to the oscilloscope. Disconnect the probe from the oscilloscope before disconnecting it from the measurement circuit.
- **Observe All Terminal Ratings:** To avoid fire or shock hazard, observe all ratings and markings on the product. Refer to the product manual for more information about ratings before connecting to the instrument.
- **Do Not Operate Without Covers:** Do not operate this product with covers or panels removed.
- **Avoid Circuit Exposure:** Do not touch exposed connections and components when power is present.
- **Do Not Operate in Wet Conditions:** Do not operate this product in wet or damp conditions.
- **Do Not Operate in Explosive Atmosphere:** Do not operate this product in an explosive atmosphere.
- **Keep Product Surfaces Clean and Dry:** Keep the input connectors and other surfaces clean and dry to prevent contamination.

2. Product Overview

The Micsig TO1104NAOP2 is a 100MHz, 4-channel digital tablet oscilloscope designed for various measurement and analysis tasks. It features an 8-inch industrial TFT LCD with multi-touch capabilities, offering a clear and intuitive user interface.

2.1 Front Panel and Controls

The front panel features the main display and a set of physical buttons for quick access to common functions.



Figure 2.1: Front Panel Layout

This image displays the front of the Micsig TO1104NAOP2 oscilloscope, highlighting its 8-inch 800x600 display. Key controls on the right side are labeled: Run/Stop, Single SEQ, Auto, 50%, Measure, Trigger, and Home. The overall dimensions are shown as 250mm width and 200mm height. An optional carry strap is also indicated.

2.2 Side Panel and Ports

The side panel provides various input/output ports for connectivity and power.



Figure 2.2: Side Panel Ports

This image shows the side view of the Micsig TO1104NAOP2 oscilloscope, indicating its 55mm thickness. Labeled ports include: Power button, LAN port, Probe calibration output, HDMI (Optional), USB host, USB device, and Charging port. The presence of an optional built-in Lithium battery is also noted.

2.3 Top Panel Connectors

The top panel houses the BNC input connectors for signal acquisition.

Technical Specifications

Model	TO1072	TO1074	TO1102	TO1104	TO1152
Analog channels	2	4	2	4	2
Bandwidth	70MHz	70MHz	100MHz	100MHz	150MHz
Real time sample rate	1GSa/S (single channel)				
Memory depth	14Mpts (single channel)	14Mpts (single channel)	28Mpts (single channel)	28Mpts (single channel)	28Mpts (single channel)
Rise time	≤5ns	≤5ns	≤3.5ns	≤3.5ns	≤2.3ns
Max waveform capture rate	80, 000wfm/s				
Bandwidth limitation	20MHz	20MHz	20MHz, High pass, low pass	20MHz, High pass, low pass	20MHz, High pass, low pass
I/O Port	Wi-Fi, LAN, HDMI, USB Host, USB Device, GND, DC Power, Trigger out				
Smartphone APP	Android / iOS				
Built-in storage capacity	8G				
Serial bus decode types	UART, CAN, LIN, SPI, I2C				
Trigger type	Edge, Pulse Width, Logic, Video, Runt, Time Out , N Edge, Slope				
Display	8" Industry TFT LCD touchable capacitive screen, resolution: 800*600 pixels, 14*10 grids				
Automatic Measurements	Period, Frequency, Rise Time, Fall Time, Delay, Positive duty Cycle, Negative Duty Cycle, Positive Pulse Width, Negative Pulse Width, Burst Width, Positive Overshoot, Negative Overshoot, Phase, Peak to Peak, Amplitude, High, Low, Max, Min, Mean, Cycle Mean, RMS, Cycle RMS.				
Dimensions	250*200*55mm				

Input impedance	1MΩ±1%|| 14.5pF±0.5pF
Input coupling	DC, AC, GND
Cursor types	Horizontal cursor, Vertical cursor, Crossing cursor
Math function	+, -, *, /, FFT
Vertical resolution	8 bits
DC gain accuracy	≤2%
Vertical scale	1mV/div~5V/div
Channel to Channel Isolation	≥40dB
Maximum input voltage	CAT I 300Vrms
Time base range	2ns/div ~ 1000s/div
Time base delay range	-14div ~ 14kS
Clock skew	≤±2ppm/Year
Time based accuracy	±20ppm
Sampling mode	Normal, Average, Peak, Envelop

Figure 2.3: Top Panel BNC Connectors

This image displays the top view of the Micsig TO1104NAOP2, clearly showing the four BNC input channels (CH1, CH2, CH3, CH4) and an Aux Out port. These are the primary connection points for oscilloscope probes.

3. Setup

3.1 Unpacking and Inspection

1. Carefully remove the oscilloscope and all accessories from the packaging.
2. Check for any signs of damage during transit. If any damage is found, contact your dealer immediately.
3. Verify that all standard accessories are present.

3.2 Powering the Device

The TO1104NAOP2 can be powered via the included AC adapter or its optional internal battery.

- **AC Power:** Connect the AC adapter to the charging port on the side of the oscilloscope and then plug it into a suitable power outlet.
- **Battery Power (Optional):** If your unit includes the optional built-in lithium battery, ensure it is charged before use. The battery charges automatically when the AC adapter is connected.



Figure 3.1: Optional Battery Feature

This image highlights the optional internal battery for the Micsig oscilloscope. It notes that due to international shipping regulations for lithium batteries, this option must be selected at the time of initial purchase.

3.3 Initial Power On

1. Press and hold the **Power** button on the side panel until the Micsig logo appears on the screen.

2. The device will boot up and display the main oscilloscope interface.

4. Operating Instructions

4.1 User Interface Navigation

The TO1104NAOP2 features a multi-touch capacitive screen for intuitive operation. You can use gestures like tap, swipe, and pinch-to-zoom to control various functions. Physical buttons on the right side provide quick access to frequently used settings.

- **Touchscreen:** Tap icons to select functions, drag waveforms to reposition, pinch to adjust scale.
- **Run/Stop:** Starts or stops waveform acquisition.
- **Single SEQ:** Acquires a single waveform sequence.
- **Auto:** Automatically sets vertical and horizontal scales and trigger level for a stable display.
- **Measure:** Accesses automatic measurement functions.
- **Trigger:** Opens trigger settings menu.
- **Home:** Returns to the main oscilloscope interface or a predefined home screen.

4.2 Connecting Probes

1. Ensure the oscilloscope is powered off or in a safe state.
2. Connect the BNC connector of the oscilloscope probe to one of the input channels (CH1-CH4) on the top panel.
3. Attach the probe tip to the circuit point you wish to measure. Ensure the probe ground clip is securely connected to the circuit's ground reference.
4. Perform probe compensation if necessary for accurate measurements. Connect the probe to the probe calibration output on the side panel and adjust the probe until a perfect square wave is displayed.

4.3 Basic Waveform Display

1. Power on the oscilloscope.
2. Press the **Auto** button to automatically adjust settings for a stable waveform display.
3. Adjust the vertical scale (Volts/Div) by pinching vertically on the waveform or using on-screen controls.
4. Adjust the horizontal scale (Time/Div) by pinching horizontally on the waveform or using on-screen controls.
5. Drag the waveform horizontally or vertically to reposition it on the screen.

4.4 Triggering

Triggering stabilizes repetitive waveforms and captures single-shot events. Press the**Trigger** button to access trigger settings.

- **Trigger Type:** Select from Edge, Pulse Width, Logic, Video, Runt, Time Out, N Edge, Slope.
- **Source:** Choose the channel (CH1-CH4) or external source for triggering.
- **Level:** Adjust the voltage level at which the trigger event occurs.
- **Mode:** Auto, Normal, Single.

4.5 Measurements and Analysis

The TO1104NAOP2 offers various automatic measurements and analysis tools.

- **Automatic Measurements:** Press the **Measure** button to display parameters like Period, Frequency, Rise Time, Fall Time, Peak-to-Peak voltage, RMS, etc.
- **Cursors:** Use horizontal and vertical cursors to manually measure time and voltage differences.

- **Math Functions:** Perform waveform arithmetic operations such as Add, Subtract, Multiply, Divide, and FFT (Fast Fourier Transform).
- **Serial Bus Decoding:** The oscilloscope supports decoding for UART, CAN, LIN, SPI, and I2C protocols. Access these functions through the menu to view decoded data.

4.6 Connectivity

The device supports various connectivity options for data transfer and remote control.

- **LAN:** Connect to a local area network for remote control and data transfer.
- **Wi-Fi (Optional):** For wireless network connectivity.
- **USB Host:** Connect USB storage devices to save waveforms and screenshots.
- **USB Device:** Connect to a PC for remote control and data transfer.
- **HDMI (Optional):** Connect to an external display for larger viewing.

5. Maintenance

5.1 Cleaning

- Clean the exterior of the oscilloscope with a soft cloth dampened with mild detergent and water.
- Do not use abrasive cleaners or solvents that may damage the casing or screen.
- Ensure the device is powered off and disconnected from all power sources before cleaning.
- Avoid getting moisture into any openings.

5.2 Storage

- Store the oscilloscope in a clean, dry environment away from direct sunlight and extreme temperatures.
- If storing for extended periods, ensure the optional battery is partially charged (around 50%) to prolong its lifespan.

5.3 Battery Care (if applicable)

- Avoid fully discharging the battery frequently.
- Charge the battery regularly, even if the device is not in use, to maintain its health.
- If the battery performance significantly degrades, contact Micsig support for service.

6. Troubleshooting

This section provides solutions to common issues you might encounter.

Problem	Possible Cause	Solution
Device does not power on	No power, discharged battery, faulty power adapter	Check power connection. Charge battery. Try a different power outlet.
No waveform displayed	Probe not connected, signal too small/large, incorrect trigger settings, channel off	Ensure probe is connected and active. Press **Auto**. Adjust vertical/horizontal scales. Check trigger level. Ensure channel is enabled.
Unstable waveform	Incorrect trigger settings, noisy signal	Adjust trigger level and mode. Use appropriate trigger type. Check signal integrity.

Problem	Possible Cause	Solution
Touchscreen unresponsive	Temporary software glitch, screen damage	Restart the device. If issue persists, contact support.
Cannot connect to network	Incorrect network settings, Wi-Fi/LAN module issue	Verify network settings. Check cable connection for LAN. Restart device and router.

7. Technical Specifications

The following table details the technical specifications for the Micsig TO1104NAOP2 Digital Tablet Oscilloscope.



Figure 7.1: Technical Specifications Overview

This image presents a comprehensive table of technical specifications for various models in the Micsig TO1000 series, including the TO1104. It covers parameters such as bandwidth, sample rate, memory depth, display characteristics, I/O ports, and measurement capabilities.

Parameter	Specification (TO1104)
Analog Channels	4
Bandwidth	100MHz
Real-time Sample Rate	1GSa/s (single channel)
Memory Depth	28Mpts (single channel)
Rise Time	≤3.5ns
Max Waveform Capture Rate	80,000wfm/s
Bandwidth Limitation	20MHz, High pass, Low pass
I/O Ports	Wi-Fi, LAN, HDMI, USB Host, USB Device, GND, DC Power, Trigger out
Smartphone APP	Android / iOS
Built-in Storage Capacity	8GB
Serial Bus Decoding	UART, CAN, LIN, SPI, I2C
Trigger Type	Edge, Pulse Width, Logic, Video, Runt, Time Out, N Edge, Slope
Display	8" Industry TFT LCD touchable capacitive screen, 800x600 pixels
Dimensions (W x H x D)	250 x 200 x 55 mm
Input Impedance	1MΩ±1% || 14.5pF±0.5pF
Input Coupling	DC, AC, GND
Vertical Resolution	8 bits
Vertical Scale	1mV/div - 5V/div

Parameter	Specification (TO1104)
Maximum Input Voltage	CAT I 300Vrms
Time Base Range	2ns/div - 1000s/div
Time Based Accuracy	±20ppm

8. Warranty and Support

Micsig products are designed for reliability and performance. For warranty information, please refer to the warranty card included with your product or visit the official Micsig website. If you encounter any issues not covered in this manual or require technical assistance, please contact Micsig customer support or your authorized dealer.

Micsig Official Website: www.micsig.com

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